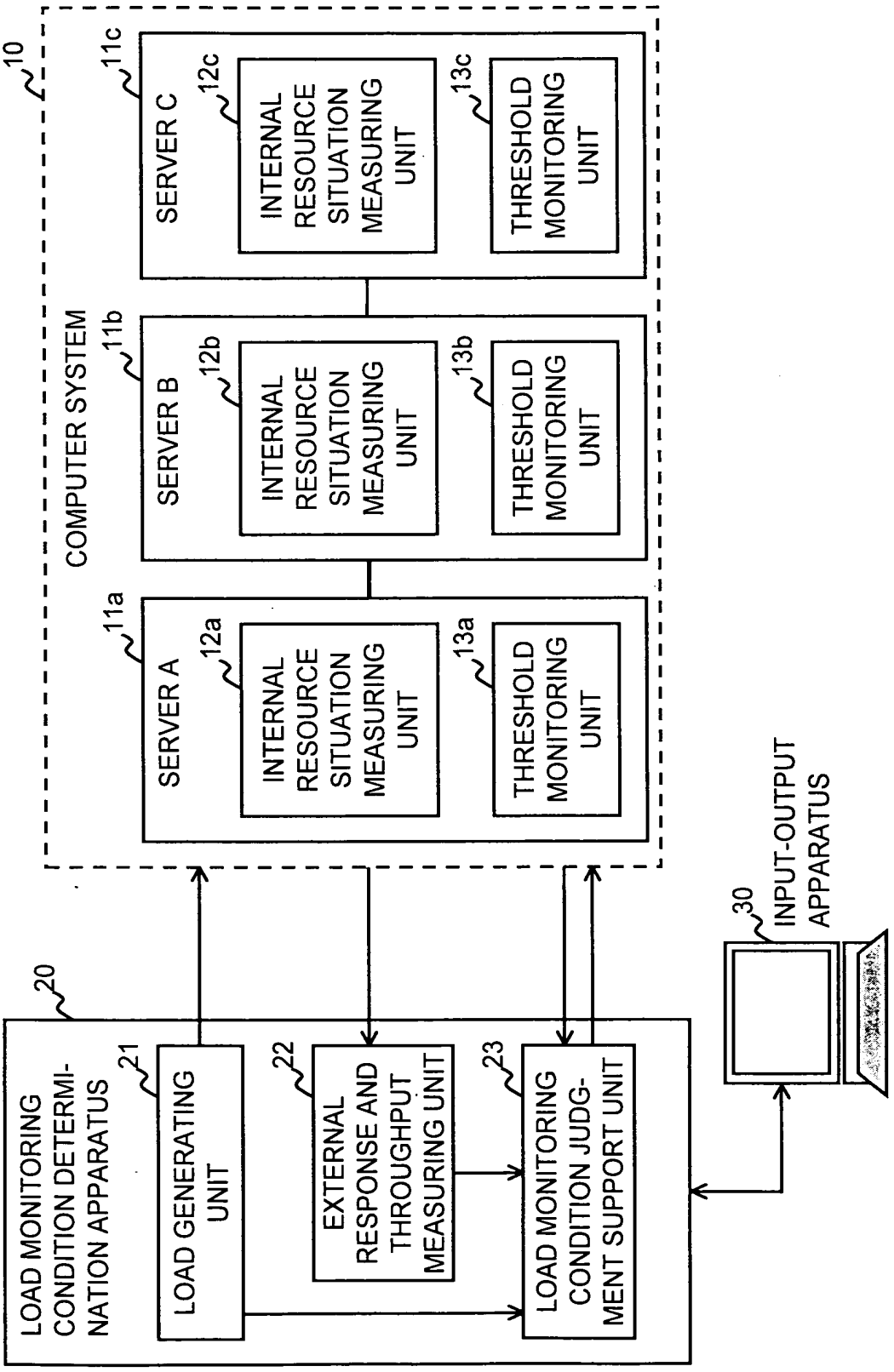

10
COMPUTER SYSTEM
11c
SERVER C
12c
INTERNAL RESOURCE SITUATION MEASURING UNIT
13c
THRESHOLD MONITORING UNIT
11b
SERVER B
12b
INTERNAL RESOURCE SITUATION MEASURING UNIT
13b
THRESHOLD MONITORING UNIT
11a
SERVER A
12a
INTERNAL RESOURCE SITUATION MEASURING UNIT
13a
THRESHOLD MONITORING UNIT
20
LOAD MONITORING CONDITION DETERMINATION APPARATUS
21
LOAD GENERATING UNIT
22
EXTERNAL RESPONSE AND THROUGHPUT MEASURING UNIT
23
LOAD MONITORING CONDITION JUDGMENT SUPPORT UNIT
30
INPUT-OUTPUT APPARATUS

FIG.1

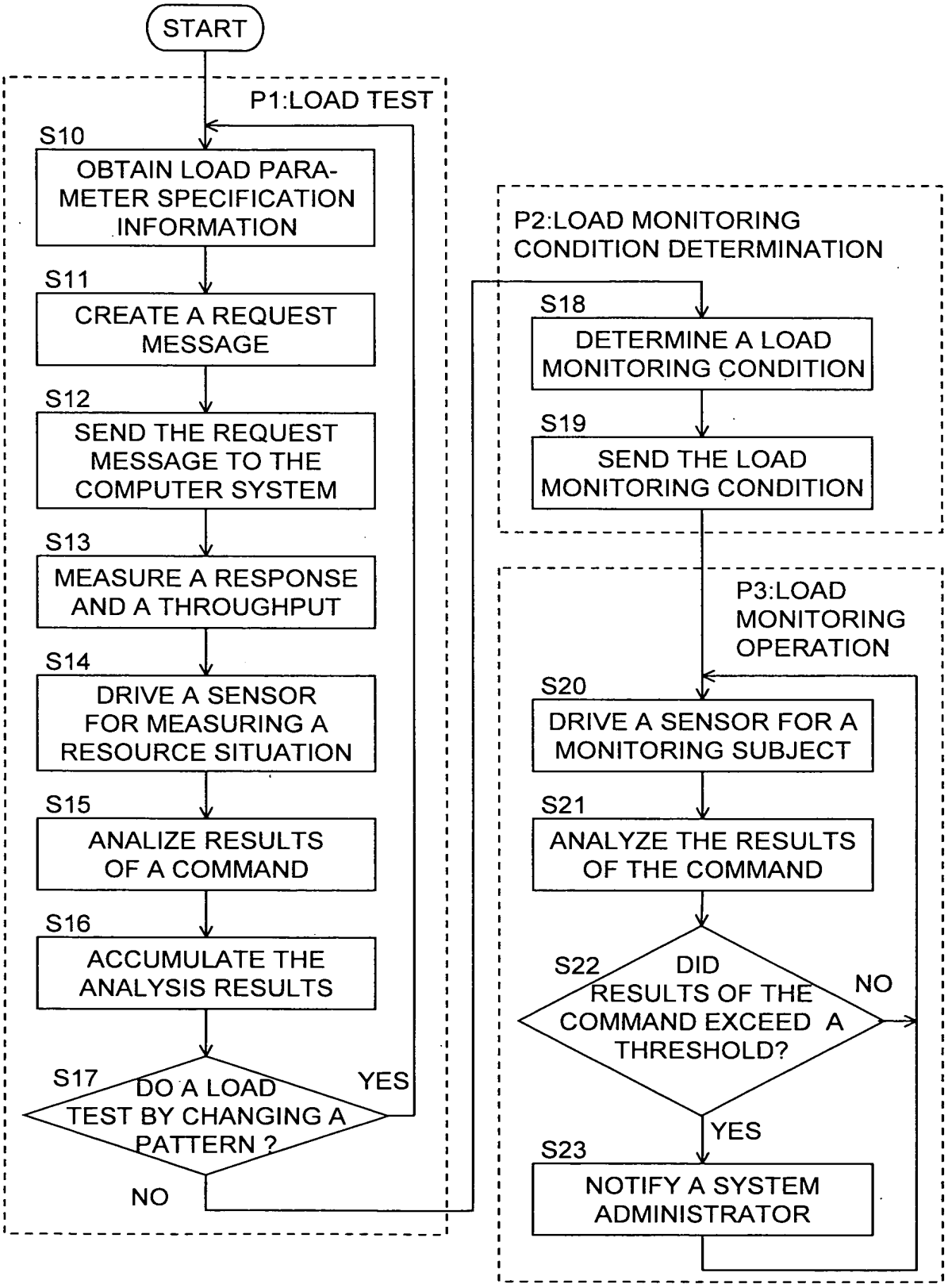

START
P1:LOAD TEST
S10
OBTAIN LOAD PARA-METER SPECIFICATION INFORMATION
S11
CREATE A REQUEST MESSAGE
S12
SEND THE REQUEST MESSAGE TO THE COMPUTER SYSTEM
S13
MEASURE A RESPONSE AND A THROUGHPUT
S14
DRIVE A SENSOR FOR MEASURING A RESOURCE SITUATION
S15
ANALIZE RESULTS OF A COMMAND
S16
ACCUMULATE THE ANALYSIS RESULTS
S17
DO A LOAD TEST BY CHANGING A PATTERN ?
YES
NO
P2:LOAD MONITORING CONDITION DETERMINATION
S18
DETERMINE A LOAD MONITORING CONDITION
S19
SEND THE LOAD MONITORING CONDITION
P3:LOAD MONITORING OPERATION
S20
DRIVE A SENSOR FOR A MONITORING SUBJECT
S21
ANALYZE THE RESULTS OF THE COMMAND
S22
DID RESULTS OF THE COMMAND EXCEED A THRESHOLD?
NO
YES
S23
NOTIFY A SYSTEM ADMINISTRATOR

FIG.2

sar -u 5 5

	%usr	%sys	%wio	%idle
09:36:25				
09:36:30	0	0	0	100
09:36:35	0	1	1	98
09:36:40	0	0	0	100
09:36:45	0	0	0	100
09:36:50	0	1	0	99
Average	0	0	0	99

FIG.3A

sar -r 5 5

	freemem	freeswap
09:45:00		
09:45:05	3820	1104608
09:45:10	3792	1104054
09:45:15	3788	1102528
09:45:20	3825	1105024
09:45:25	3836	1105024
Average	3812	1104248

FIG.3B

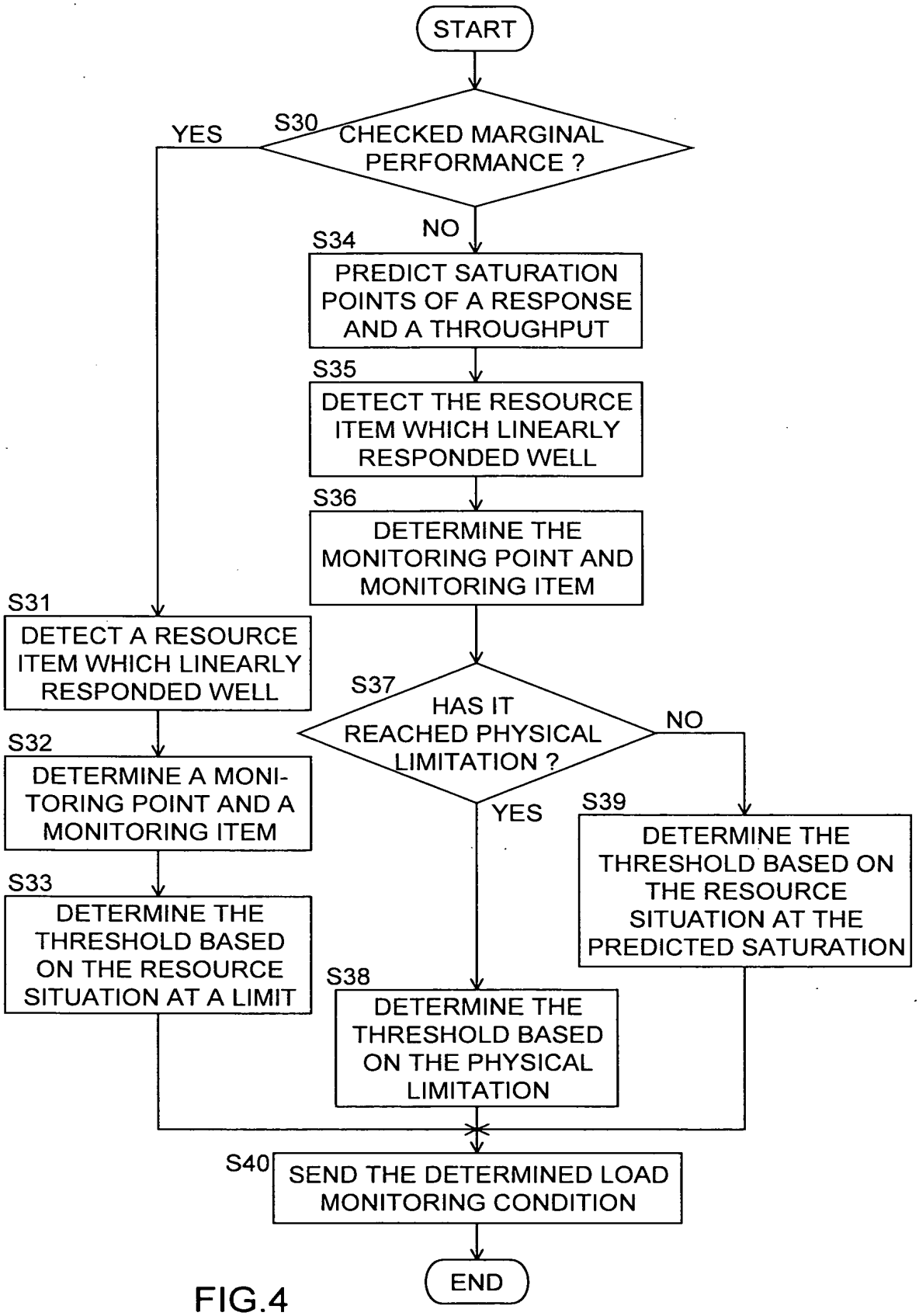

START
S30
CHECKED MARGINAL PERFORMANCE ?
YES
NO
S34
PREDICT SATURATION POINTS OF A RESPONSE AND A THROUGHPUT
S35
DETECT THE RESOURCE ITEM WHICH LINEARLY RESPONDED WELL
S36
DETERMINE THE MONITORING POINT AND MONITORING ITEM
S31
DETECT A RESOURCE ITEM WHICH LINEARLY RESPONDED WELL
S37
HAS IT REACHED PHYSICAL LIMITATION ?
NO
YES
S32
DETERMINE A MONITORING POINT AND A MONITORING ITEM
S39
DETERMINE THE THRESHOLD BASED ON THE RESOURCE SITUATION AT THE PREDICTED SATURATION
S33
DETERMINE THE THRESHOLD BASED ON THE RESOURCE SITUATION AT A LIMIT
S38
DETERMINE THE THRESHOLD BASED ON THE PHYSICAL LIMITATION
S40
SEND THE DETERMINED LOAD MONITORING CONDITION
END

FIG.4

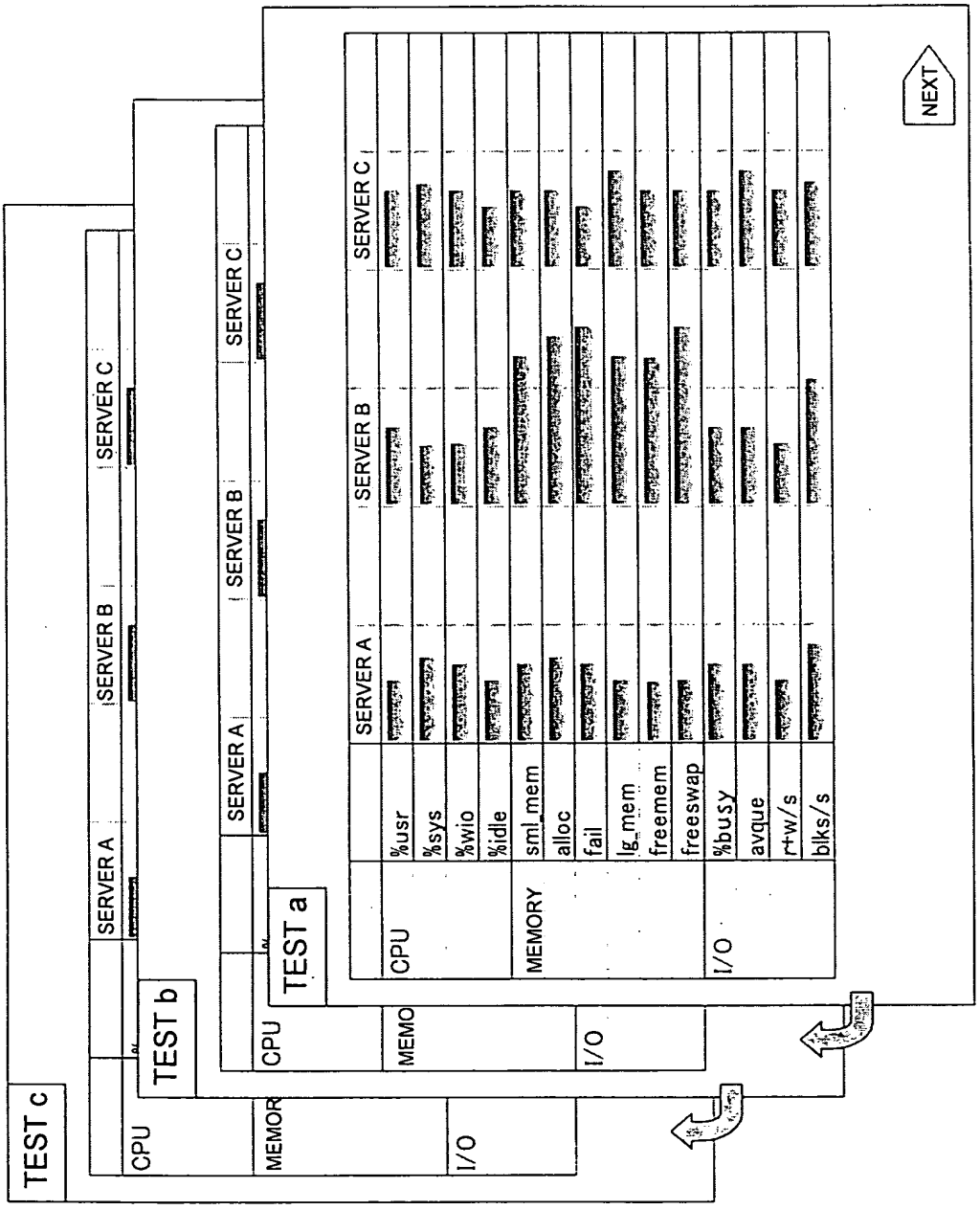
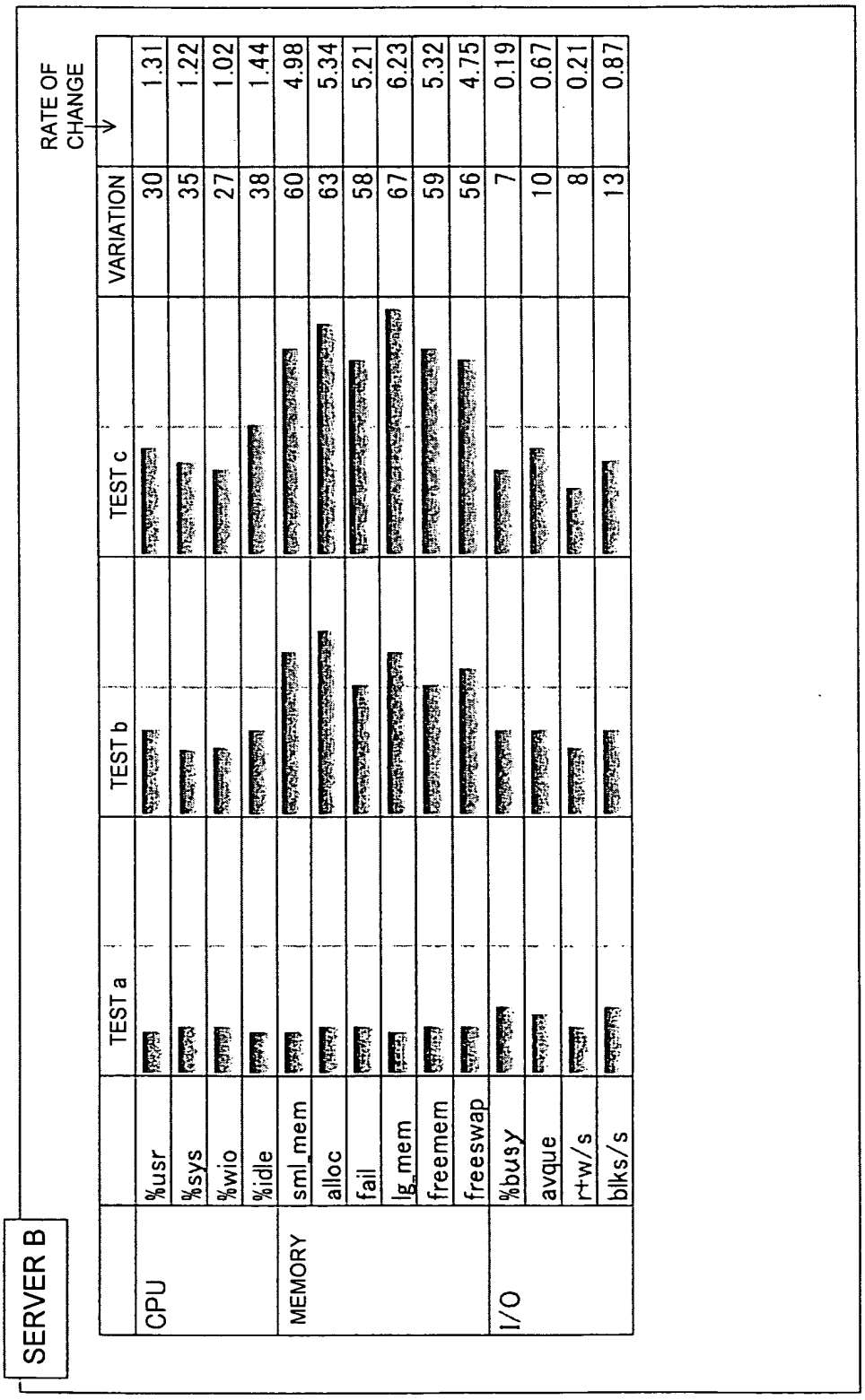

TEST c
TEST b
TEST a
CPU
MEMORY
I/O
SERVER A
SERVER B
SERVER C
%usr
%sys
%wio
%idle
sml_mem
alloc
fail
lg_mem
freemem
freeswap
%busy
avque
r+w/s
blks/s
NEXT

FIG.5



		TEST a	TEST b	TEST c	VARIATION	↓
CPU	%usr				30	1.31
	%sys				35	1.22
	%wio				27	1.02
	%idle				38	1.44
MEMORY	sml_mem				60	4.98
	alloc				63	5.34
	fail				58	5.21
	lg_mem				67	6.23
	freemem				59	5.32
	freeswap				56	4.75
I/O	%busy				7	0.19
	avque				10	0.67
	r+w/s				8	0.21
	blks/s				13	0.87

FIG.6

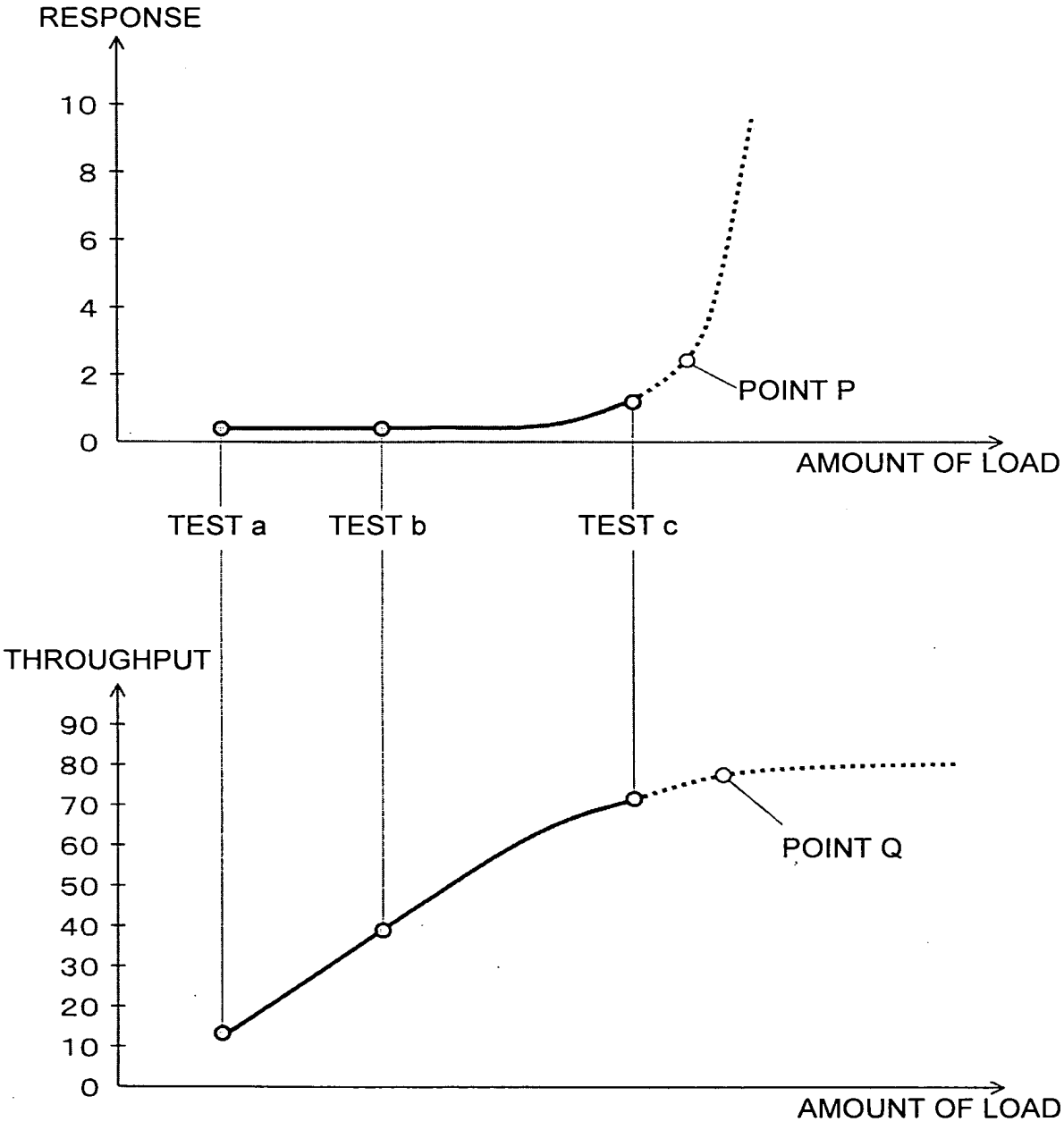

RESPONSE
10
8
6
4
2
0
POINT P
AMOUNT OF LOAD
TEST a
TEST b
TEST c
THROUGHPUT
90
80
70
60
50
40
30
20
10
0
POINT Q
AMOUNT OF LOAD

FIG.7

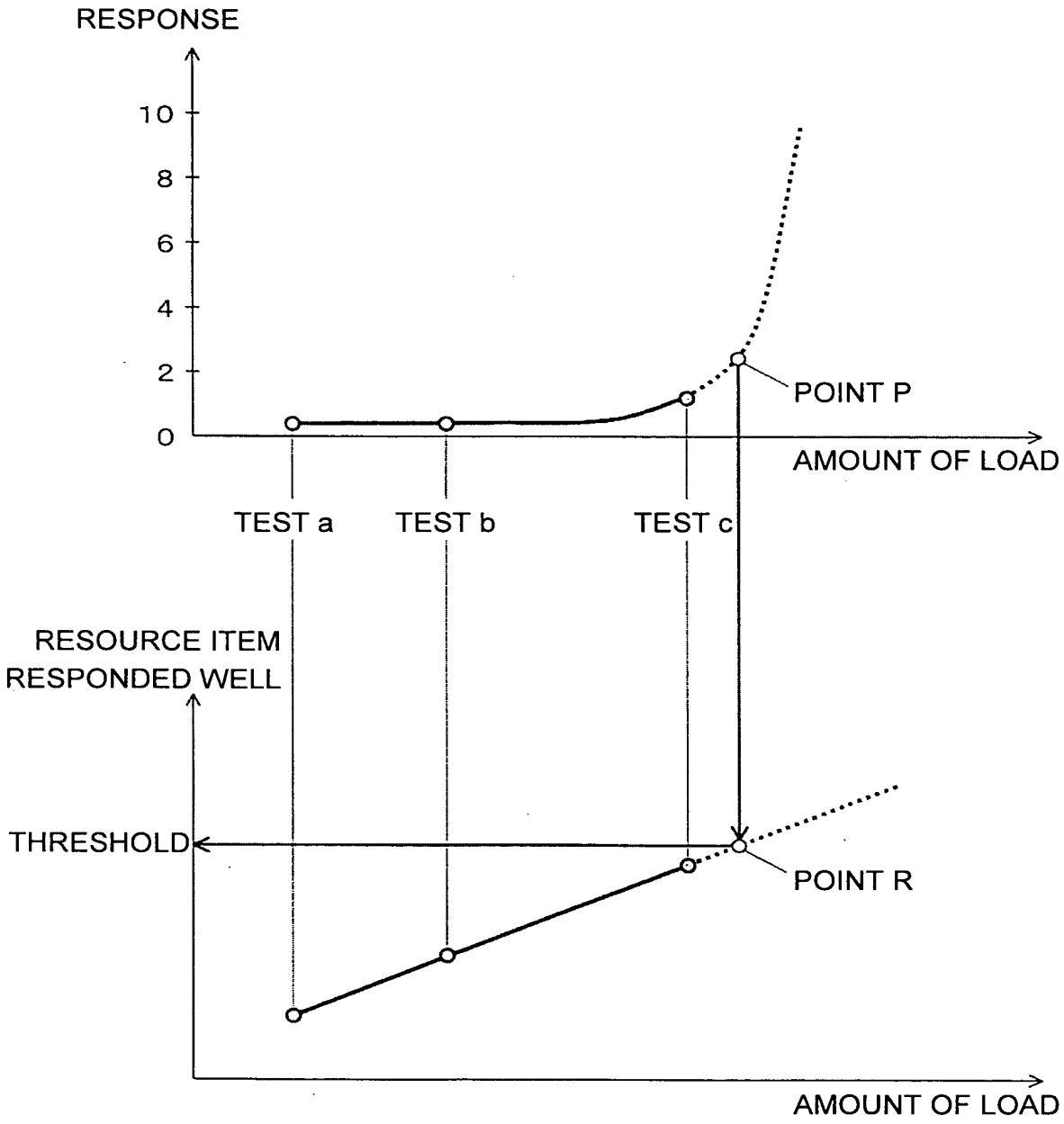

RESPONSE
10
8
6
4
2
0
POINT P
AMOUNT OF LOAD
TEST a
TEST b
TEST c
RESOURCE ITEM
RESPONDED WELL
THRESHOLD
POINT R
AMOUNT OF LOAD

FIG.8

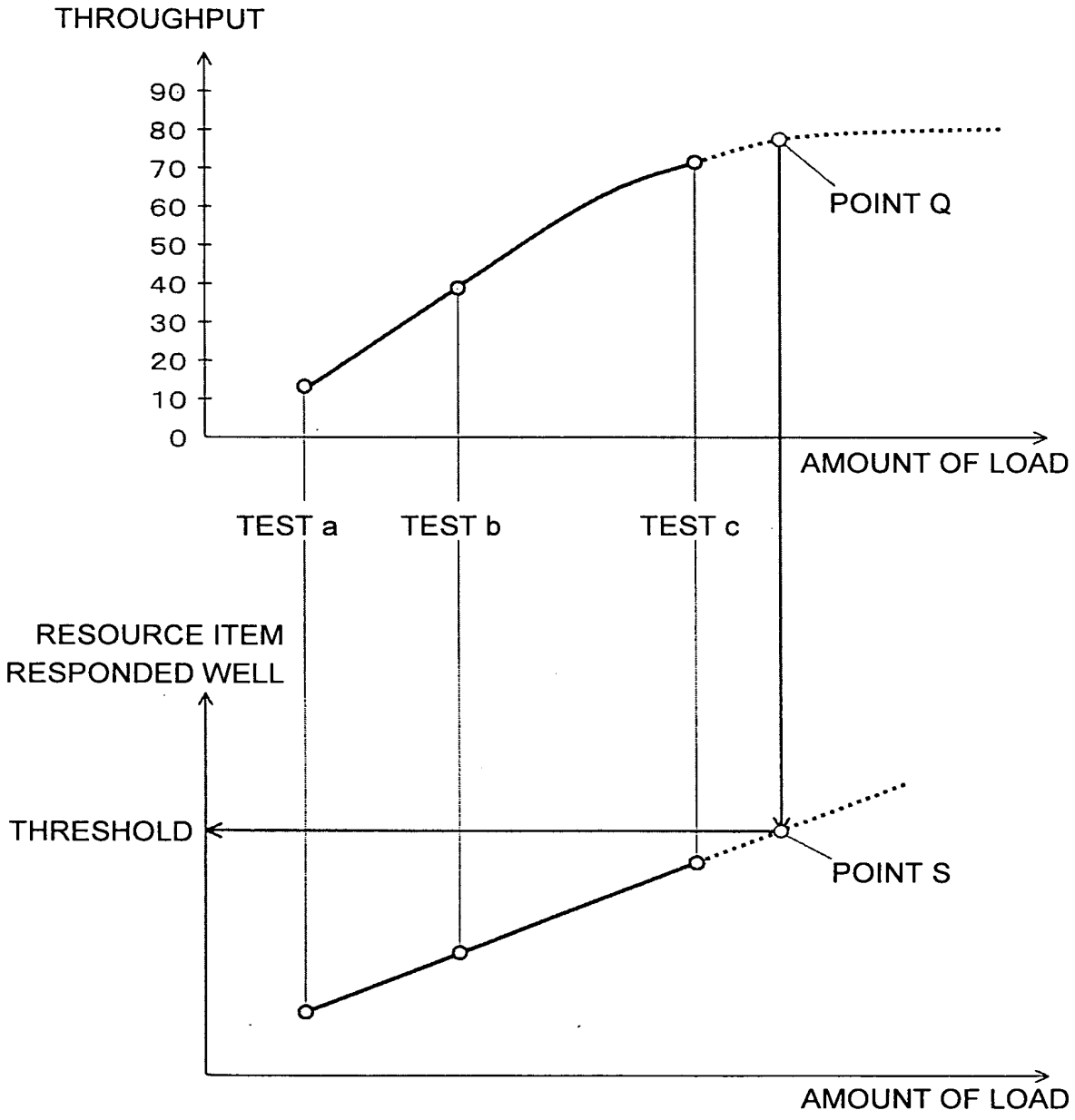

THROUGHPUT
90
80
70
60
50
40
30
20
10
0
POINT Q
AMOUNT OF LOAD
TEST a
TEST b
TEST c
RESOURCE ITEM
RESPONDED WELL
THRESHOLD
POINT S
AMOUNT OF LOAD

FIG.9